NOTES ON THE FLORA OF CHINA, III

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With two plates

CRITICAL NOTES on ambiguous binomials concerning the Chinese flora, additional information regarding certain Chinese plants, and the proposal of eight new species, four new varieties, and two new combinations are presented in this paper. Unless identified by (G), indicating that the material is deposited in the Gray Herbarium, all the specimens cited are to be found in the Herbarium of the Arnold Arboretum.

Clematis angustifolia Auct.

Jacquin in 1762 [1] published the species *Clematis angustifolia*, from the coast of southern Europe. According to his description the species was a glabrous vine with pinnate leaves and linear leaflets. Pallas in 1776 described *Clematis hexapetala*, an erect plant with tomentose perianth from eastern Siberia in the regions of the Argun and Onon Rivers. In 1786 Jacquin, probably on account of the shape of the leaf segments, doubtfully amalgamated these geographically widely separated and morphologically manifestly different species. In the discussion of his *Clematis angustifolia* he wrote as follows, expressing his doubt: "An haec eadem cum Ammaniana planta, a Pallasio citata, sit, dubito, quum nostra sit glabra tota, Ammanius vero dicat caules superius lanuginosos . . ." In the same year, under the name *Clematis angustifolia*, he published a colored plate illustrating a plant which he described as erect and with pinnate recurved leaves and linear-lanceolate leaflets. Judging from this illustration and description, Jacquin's concept of his own *Clematis angustifolia* had, by this time, changed from a climbing glabrous vine growing on the coast of southern Europe to an erect pubescent plant occurring in the mountains of central Siberia, for in the Gray Herbarium there is a specimen collected by Schschukin in Irkutsk which matches Jacquin's illustration in every respect. This illustration of Jacquin's has been very misleading, for in the last two centuries botanists who named plants by matching them with illustrations have identified all members of that heterogeneous group of erect herbaceous perennial *Clematis* from North China, Manchuria, Korea, and Eastern Siberia as *Clematis angustifolia* Jacq. Meanwhile most authors who have published accounts of the flora of eastern and northeastern Asia have indiscriminately applied such identifications. Now, both in the herbaria and the literature, we have this oriental taxon carrying an occidental binomial. As Jacquin's species was first published as a climbing

[1] Enumeratio Stirpium Plerarumque, quae Sponte Crescunt in Agro Vindobonensi, Montibusque Confinibus 310.

plant growing on the coast of southern Europe, the application of that binomial should be limited to plants of that region, in spite of the fact that Jacquin later changed the concept of his species. A. P. De Candolle in 1817 (Regni Vegetabilis Systema Naturelle 134, 154) treated *Clematis maritima* Linn. as a variety of *Clematis flammula* Linn. var. *maritima* (L.) DC. in one place and later used it again as a synonym of *Clematis angustifolia* Jacq. In so doing, he seems to have given us a hint that Jacquin's original *Clematis angustifolia* might have been a *Clematis flammula* Linn. var. *maritima* DC., since *Clematis flammula* Linn. is a vine with pinnatisect leaves, and the variety, *C. flammula* Linn. var. *maritima* (L.) DC., has linear segments. This vine habit and the pinnatisect leaves with linear segments are distinguishing characters which Jacquin at first ascribed to his *C. angustifolia*. In the herbarium of the Arnold Arboretum there is a collection from Yeste, Spain, labeled *C. flammula* Linn. var. *maritima* (L.) DC. This specimen represents a glabrous vine with pinnatisect leaves. The linear segments of these leaves appear similar to those of some form of the Chinese elements. It is very likely that this represents the true *C. angustifolia* Jacq., which is very different from the taxon of northeastern Asia, which should be designated as *Clematis hexapetala* Pallas.

Hayata in 1913 overlooked Jacquin's binomial and published a *Clematis angustifolia* from Formosa. This species was originally described as *Clematis leschenaultiana* DC. var. *angustifolia* Hayata in Jour. Coll. Sci. Univ. Tokyo **30**: 16. 1911. It represents a vine with densely tomentose stems and leaves. The leaves are trifoliate with ovate or oblong-lanceolate leaflets which are remotely serrate. The achenes of this species are fusiform. *Clematis leschenaultiana* DC. was originally described from Java. It has been recorded from the Philippines, Formosa, and the warmer regions of the Chinese mainland, as well as from the western Malaysian area. After comparing specimens collected within this wide range I have decided that the Formosan material is not specifically distinct.

Clematis hexapetala Pallas, Reise **3**: 735, *pl. Q, fig. 2*. 1776, et Voy. **4**: 701, *pl. 14, fig. 3*. 1793. — Komarov & Schischkin, Fl. URSS **7**: 318. 1937. — Kitagawa, Lin. Fl. Mansh. 217. 1939. — Nakai in Jour. Jap. Bot. **20**: 191. 1944.

Clematis angustifolia Jacq., Ic. Pl. Rar. **1**: 11, *pl. 104*. 1786 (non Jacq. 1762). — DC., Syst. **1**: 153. 1817, et Prodr. **1**: 7.1824. — Bunge in Mém. Div. Sav. Acad. Sci. St. Pétersb. **2**: 75 (Enum. Pl. Chin. Bot.). 1833. — Ledeb., Fl. Ross. **1**: 2. 1841. — Maxim. in Mém. Div. Sav. Acad. Sci. St. Pétersb. **9**: 468 (Ind. Fl. Pekin.). 1859, et Enum. Pl. Mongol. 2. 1889. — Franch. in Nouv. Arch. Mus. Paris II. **5**: 166 (Pl. David **1**: 14). 1882. — Hemsl. in Jour. Linn. Soc. Bot. **23**: 2. 1886. — Nakai in Jour. Coll. Sci. Univ. Tokyo **26**: 11 (Fl. Kor. **1**: 11). 1909, et **31**: 426 (Fl. Kor. **2**: 426). 1911. — Cowdry in Jour. Roy. As. Soc. N. China **53**: 160 (Pl. Peitaiho). 1922 — Limpricht, Bot. Reis. Hochgeb. Chin. Ost-Tib. 374. 1922. — Rehder in Jour. Arnold Arb. **4**: 185. 1923. — Komarov, [Fl. Manchzh.] **2**: 288. 1950.

Clematis pallasii Gmel. Syst. 873. 1791.

Clematis recta Linn. var. *angustifolia* (Jacq.) Kuntze in Verh. Bot. Brand. **26:** 112. 1884.

Clematis angustifolia Jacq. var. *breviloba* Freyn in Oesterr. Bot. Zeit. **45:** 59. 1895, et **51:** 374. 1901.

Clematis angustifolia Jacq. var. *dissecta* Yabe, Higasi-Moko Syokubutsu Mokuroku 14. 1917.

Clematis angustifolia Jacq. forma *dissecta* (Yabe) Kitagawa in Rep. First Sci. Exped. Manch. IV. **4:** 17, 83. 1936.

Clematis hexapetala Pallas forma *dissecta* (Yabe) Kitagawa, Lin. Fl. Mansh. 217. 1939.

Clematis hexapetala Pallas forma *breviloba* (Freyn) Nakai in Jour. Jap. Bot. **20:** 191. 1944.

CHINA: Chili [Hopei]: Hsiao-wu-tai shan, *T. N. Meyer 92*; Peking, *S. W. Williams*, Aug. 1876 (G); Hsing-lung shan, *J. C. Liu 622*.

EASTERN SIBERIA AND MANCHURIA: Kirin, *F. H. Chen 182* (G); Dairen, Chinchou, *P. H. Dorsett & W. J. Morse 5937* (G); Harbin, *P. H. & J. H. Dorsett 3292* (G); Nertschinsk [Nerchinsky], *F. Karo* (Plantae Dahuriae) *152c* (ISOTYPE of *Clematis angustifolia* Jacq. *β breviloba* Freyn); Blagowjestschensk, *F. Karo 113b*; Chabarovsk [Khabarovsk], *V. Komarov 706*; Khinganskia, *D. Litvinow 326, 1015*; [Ta-ho-shang shan], *K. Kobayashi*, June 19, 1933; Suifenho, *B. V. Skvortzov*, July 10, 1926; Greater Khingan, Djalautins, *B. V. Skvortzov*, July 27, 1938. Mukden [Moukden], *E. H. Wilson 8818*.

Pallas was the first post-Linnaean botanist who described and illustrated the northeastern Asian erect herbaceous perennial *Clematis* and named it *C. hexapetala*. The leaf of his plant is "per caulem opposita, adscendentia, pinnata: foliolis duris venosis, marginatis, acutis, imi paris ramoso-quadrifidis, superioribus lanceolatis bifidisque, terminali tripartito." The segment of the perianth is "oblonga, extus tomentosa." Plants so characterized had been recorded from Manchuria, northern Korea, and the North China Highlands extending from Long. 108° E. and Lat. 34° N. northeastward to Long. 122° E. and Lat. 40° N. Unfortunately, on account of Jacquin's changed concept of his European species of *C. angustifolia* and his misleading illustration of 1776, this taxon has appeared as *C. angustifolia* Jacq. in botanical literature, especially in that concerning the flora of North China.

Clematis hexapetala Pallas is essentially an upland species growing on grassy mountain slopes. Its distribution is very interesting. So far as our material and records show, it has never been collected west of Long. 103° E. nor south of Lat. 34° N. Its range forms a U-shaped area on the map, with Khabarovsk and northern Korea on the curve, northern Manchuria, Dahuria, and the Lake Baikal area on the northern arm, and with southern Manchuria and the North China Highlands on the southern arm.

The material collected within this range exhibits a definite pattern of variation in the size and shape of the ultimate segment of the pinnatisect leaves. Some of these are linear, measuring up to 5 cm. long and 5 mm. wide in the middle, while others are lanceolate, up to 10 cm. long and 10 mm. or more wide in the middle. Since 1895 many trinomials have been

proposed for the different forms of this variation. Although in the original description the measurements of the ultimate segments of the leaves of typical *C. hexapetala* Pallas were not given, and the type material is not accessible to me for comparison, from Pallas' illustration I am inclined to think that he definitely had a narrow-segmented form with segments 2.5–5 cm. long and 3–5 mm. wide at the middle, and acute at the apex.

When Freyn described his varieties, he stated for *C. angustifolia* Jacq. *α longiloba*, "Die Blätter doppelt gefiedert, mit lineal-lanzettlichen Abschnitten; letztere 8–10 mal länger als breit (4–6–10 mm.). Die Blüten bis 5 cm. im Durchmesser, die jungen Sepalen aussen dickt filzig wollig." For his *C. angustifolia* Jacq. *β breviloba* he gave no measurements but simply added, "wie vorige, aber die Blattabschnitte bei gleicher Breite viel kürzer." Here in the herbarium of the Arnold Arboretum there is an isotype, *F. Karo 152c*, for the latter variety. The size and shape of the ultimate segments of the pinnatisect leaves are identical with those shown in Pallas' illustration. Freyn probably did not realize that Nerchinsky, the locality where *Karo 152c* was collected, lies between the rivers Argun and Onon, the type locality of *C. hexapetala* Pallas. The morphological identity and the geographical coincidence lead me to decide that Freyn's *C. angustifolia* Jacq. *β breviloba* is identical with the typical *C. hexapetala* Pallas. The trinomials proposed by the Japanese botanists have been interpreted as synonyms of *C. angustifolia* Jacq. *β breviloba* Freyn by Nakai. They are here treated as synonyms of *C. hexapetala* Pallas.

Pritzel in 1900 recorded this species under the name of *C. angustifolia* Jacq. from T'ai-pa-shan of southwestern Shensi, as represented by *Giraldi 865*. If his identification is dependable, this collection marks the southernmost limit in the range of distribution for the species. As I have not seen Giraldi's specimen, I am not sure whether it actually belongs here or not.

Clematis hexapetala Pallas var. **longiloba** (Freyn) comb. nov.

Clematis angustifolia Jacq. *α longiloba* Freyn in Oesterr. Bot. Zeit. **45**: 59. 1895.

CHINA: Chili [Chihli, Hopei]: Peking, Western Hills, *P. H. Dorsett & W. J. Morse 7035*; same locality, *Bretschneider* in 1881 (ex Herb. F. B. Forbes 1807); Kiang-hsuai ho, *T. F. King 171*; San-tun-ying, *F. N. Meyer 91*; Hsiao-wu-tai shan, *F. N. Meyer 1352*; same locality, *C. W. Wang 61450*; Wei-chang, *Wm. Purdom 44*; without precise locality, Father *Chanet 28*. Shansi: central part of the province, Lu-yah shan, H. Smith's collector, *Lao Ch'in 8147*.

EASTERN SIBERIA OR MANCHURIA: Zejshaja Pristan am Zeaflusse, *F. Karo 334*, July 1899; Blagovesczensk, *F. Karo*, July 16, 1904; Amur, super et medius, *Korskinsky* in 1891 (G); Ircutsk [Irkutsk], *Schschukin* (G); Moukden, *J. Webster* in 1887 (G); Dahuria, *Turczaninow 8*, Nov. 1859 (G).

KOREA: Pyengyan, *Mrs. R. K. Smith*, July 5, 1937.

This variety is characterized by the larger leaf segments, which are 10–15 mm. wide, attenuated at both ends, acute, rarely obtuse at the apex, sparsely villose on the principal nerves, especially beneath, glabrescent

later in the season. This variety has been introduced into cultivation. I have seen material from Jewell Nursery, Lake City, Minnesota, which is identical with our spontaneous collections. In North China the plant grows on grassy slopes along the dry hillsides. Its white flowers appear in June and July. The obovate achenes are 5 mm. long, 3.5 mm. wide, compressed, villose, and with a persistent densely villose curved style up to 3.5 cm. long.

Clematis hexapetala Pallas var. **smithiana** var. nov.

Herba erecta perennis, 20–30 raro usque 60 cm. alta; foliis pinnatisectis, segmentis ultimis lanceolatis, 1.5–3 cm. longis, 3–7 mm. latis, apice obtusis apiculatisque, subtus villosis, inflorescentiis subpaniculatis, perianthiis lanatis, segmentis oblanceolatis, 1 cm. longis, 3 mm. latis, antheris oblongis, 1.5 mm. longis, carpellis albo-villosis.

CHINA: Shansi: Yün-ch'eng, Chung-t'iao shan, *H. Smith 6039* (TYPE); Huo hsien, *T. Tang 1010*.

This is a dwarf variety which is usually 20–30, rarely up to 60 cm. high at the flowering stage. It can easily be distinguished from all other varieties of this species by its villose lower leaf-surface. It occurs in southern Shansi at an altitude of 1850 meters. The white flower appears in July.

Clematis hexapetala Pall. var. **tchefouensis** (Debeaux), comb. nov.

Clematis angustifolia Jacq. var. *tchefouensis* Debeaux in Act. Soc. Linn. Bordeaux **31**: 117 (Fl. Tché-fou 22). 1877.
Clematis angustifolia sensu Faber in Denkschr. Entwickel. Kiautschou 31. 1898. — sensu Rehder in Jour. Arnold Arb. **4**: 185. 1923, pro parte, non Jacquin, 1762.

CHINA: Shantung: Tche-fou [Chefoo, Chih-fou, Yen-t'ai], *O. Debeaux* (ISOTYPE of *Clematis angustifolia* Jacq. var. *tchefouensis* Debeaux); Tsingtao, Li-chuan, *C. Y. Chiao 2979*; near coast, *A. Jacot*, July 1, 1927; Lao shan, 33 miles south of Tsaingtao, *C. Y. Chiao 2691*.

This variety was originally described on the basis of material collected from the north shore of the Shantung Peninsula. Additional material has proved its rather extensive range, extending to the southern end of the peninsula. It can be distinguished from typical *Clematis hexapetala* Pall. by its subglabrous perianth, which is 2–2.5 cm. in diameter at anthesis.

Clematis hexapetala Pall. var. **insularis**, var. nov.

Herba erecta, caudicibus 1 m. altis, 4 mm. crassis, foliis pinnatisectis, segmentis lobatis vel partitis, ultimo lanceolato, 3–6 cm. longo, 8–13 mm. lato, apice obtuso mucronatoque; floribus subpaniculatis, pedicellis 5–8 cm. longis, perianthiis glabrescentiis, 2.5 cm. diametro.

CHINA: Shantung: Tsingtao, Tsingtao Island, *C. Y. Chiao 2521* (TYPE).

This erect, herbaceous, broad-segmented variety is endemic to a small island on the southern coast of the Shantung Peninsula, where it grows on sandy slopes at sea level. Its white flowers appear in mid-June. Its leaf-

segments resemble those of *C. hexapetala* Pall. var. *longiloba* (Freyn) S. Y. Hu, but the latter taxon can easily be distinguished by its white lanate perianth and sparsely villose nerves on the lower surface of the leaves, while the perianth of this variety is glabrescent and the leaves entirely glabrous.

Clematis hexapetala Pall. var. **elliptica** var. nov.

Clematis angustifolia sensu Finet & Gagnepain, Contrib. Fl. As. Or. **1**: 21. 1905, pro parte. — sensu Loes. in Beih. Bot. Centralbl. **37** (Abt. 2): 112. 1919, non Jacquin, 1862.

Herba erecta perennis; foliis pinnatisectis, praeter nervos subtus glabris, segmento ultimo lanceo-elliptico, 1.5–3 raro usque 5 cm. longo, 4–5 raro usque 8 mm. lato, apice obtuso mucronatoque; perianthiis glabrescentiis.

CHINA: Shantung: Tsingtau [Tsingtao], *Zimmerman 205* (TYPE), *448*.

This variety can be distinguished by its very deeply cut lanceo-elliptic segments of the leaves which are obtuse at the apex. In general appearance it resembles *C. hexapetala* Pall. var. *smithiana* S. Y. Hu of southern Shansi, but the latter variety has a lanate perianth and villose lower leaf surfaces.

Freyn in 1895, on the basis of *F. Karo 125b* collected from Nertschinsk [Nerchinsky], described a form which he named forma *stenophylla*. According to his description, the segments of the leaves are up to 6 cm. long and only 1 mm. wide. In the Gray Herbarium of Harvard University there is a fruiting specimen, *T. Y. Cheo & L. Yen 98*, collected from Feihsien of Shantung Province, of which the segments of the leaves are 5–9 cm. long, 3 mm. wide. Flowering material of the narrow-segmented form from the latter region is awaited for its identity.

Tinospora craveniana sp. nov. (*Pl. I, fig. 6*).

Frutex scandens, ramis striatis sulcatisque, 2–3 mm. diametro, hornotinis hirsutis, internodiis 7–10 cm. longis; foliis tenuiter chartaceis, sagittato-ellipticis, 5.5–11.5 cm. longis, 3–5 cm. latis, basi sagittatis, interstitio inter apices auricularum 1.5–2.5 cm. longo, apice acuminatis, acumine 5–8 mm. longo, integris, praeter nervos glabris, nervis primariis 5, palmatis, nervis secundariis laxe reticulatis, utrinque prominulis, petiolo 2.5–3.5 cm. longo, hirsuto; inflorescentiis racemosis; ♂ racemis fasciculatis, pedunculis gracilibus, 15 mm. longis, hirsutis, rhachibus 4 cm. longis, bracteis lanceolatis, 1–2 mm. longis, pedicellis 12–30 mm. longis, sparse hirsutis, prophyllis 1 vel 2; floribus 3-meris, sepalis 6, glabris, extimis oblongis, 2 mm. longis, intimis lineari-oblongis, 4–5 mm. longis, 1 mm. latis, apice acutis; petalis 6, carnosis, apice suborbicularibus, basi cuneatis, 2 mm. longis; staminibus 6, 3 mm. longis, thecis oblongis, 1 mm. longis, rimis lateralibus dehiscentibus; ovario rudimentario minuto, globoso; ♀ racemis solitariis, pedunculis 4–5 cm. longis; floribus ignotis; fructibus subglobosis, 9–10 mm. diametro, endocarpiis osseis, subhemisphaericis, 7–8 mm. diametro, ventro excavatis, dorso lineis obsoletis, inconspicuis tuberculatis.

CHINA: Kiangsi: Hwang-kong shan, *Y. K. Hsiung 6402* (TYPE, fruit). Szechuan: Mt. Omei, *T. T. Yü 563* (TYPE, staminate flower).

The outline of the anterior portion of the leaf of this species appears to resemble that of *T. malabarica* (Lam.) Miers., but the base of the leaf of the latter species is cordate, not sagittate. The indumentum on the nerves of the lower surface and the sagittate leaf-base of *T. craveniana* suggest relationship with *T. sagittata* (Oliver) Gagnep., but the latter species has linear-lanceolate leaves, smaller flowers with the sepals measuring only 2.5–3 mm. in length, obtuse or rounded at the apex, and suborbicular anthers.

This species is named in honor of Miss Mary G. Craven, who retired in January 1953 after forty-eight years of service in the Herbarium of the Arnold Arboretum of Harvard University. Her skillful handling of the specimens has established a monument to her care of the material as well as to her friendship and association with all who have done taxonomic research in this herbarium, from the days of its founder, Charles S. Sargent, up to the present.

Tinospora imbricata sp. nov. (*Pl. I, fig. 2*).

Tinospora capillipes sensu Chun in Sunyats. **4**: 176, *fig. 34*. 1940. — sensu Yamamoto in Taiwania **1**: 32. 1948, pro parte, non Gagnepain, 1908.

Frutex scandens, ramulis striatis, 2.5 mm. diametro, sparse hirsutis, internodiis 7–13 cm. longis; foliis chartaceis, ovato-oblongis, 12–14 cm. longis, 4–4.8 cm. latis, basi cordatis, lobis auriculatis, imbricatis, apice caudatis, acumine 2 cm. longo, supra glabris, subtus praeter nervos glabris, nervis primariis 7, palmatis, utrinque elevatis, nervis secundariis laxe reticulatis, utrinque conspicuis; petiolo 7 cm. longo, hirsutis, basi tortile; floribus ignotis; infructescentiis subracemosis, pedunculis 3.5–9.5 cm. longis, glabrescentibus, pedicellis 9–12 mm. longis, stipite ovarii 2–5 mm. longo; fructibus rubris, subglobosis, 8–9 mm. diametro, endocarpiis pergameis, 7 mm. longis, 8 mm. latis, ventro excavatis, dorso lineis obscuris, ceterum inconspicuo-rugosis.

CHINA: Kwangsi: Yao-shan, *C. Wang 40521* (TYPE).

This species occurs along the streams in central Kwangsi at altitudes of about 1300 meters. Its red fruits remain on the vine in December. Gagnepain in 1908 described *T. capillipes* on the basis of Balansa's collection from Tonkin.

The type of *T. capillipes* represents a staminate plant which has pubescent sepals. I have seen no specimen of this species. Judging from Gagnepain's illustration (Fl. Gén. Indo-Chine 1: 133. *fig. 14, 11*. 1908), that species is characterized by its ovate leaves with sagittate bases. The basal lobes are rounded and are far apart. Chun in 1940 interpreted *C. Wang 40521* as *T. capillipes* Gagn., but Wang's collection has ovate-oblong leaves with imbricate basal lobes and represents a taxon very different from Gagnepain's species. Yamamoto did not see Wang's collection. In

recording the occurrence of *T. capillipes* Gagn. in Kwangsi he simply adopted Chun's interpretation.

Tinospora intermedia sp. nov. (*Pl. I, fig. 5*).

Frutex scandens, ramulis vetustioribus longitudinaliter rimulosis, hornotinis hirsutis; foliis chartaceis, sagittato-oblongis, raro sagittato-ovatis, 7–11 cm. longis, 3.5–4.5 cm. latis, basi sagittatis, interstitio inter apices auricularum 3.5 cm. longo, apice acuminatis, acumine 6–8 mm. longo, apiculato; inflorescentiis staminatis fasciculatis, pedunculis 2–3.5 cm. longis, bracteis ovatis, ciliatis, 1–1.5 mm. longis, pedicellis 1–1.5 cm. longis, prophyllis 1 vel 2, ovatis, apice ciliatis, cum pedunculis glabrescentibus; sepalis 6, glabris, extimis ovatis, 1–2 mm. longis, intimis oblanceolatis, 3 mm. longis, petalis 6, carnosis, suborbicularibus, apice truncatis; staminibus 6, petalis longioribus, antheris subglobosis, 0.5 mm. diametro; infructescentiis paniculatis, pedunculis 9 cm. longis, fructibus ellipsoideis, 8 mm. longis, 7 mm. diametro, apice apiculatis, endocarpiis pergameneis, ventro excavatis, dorso ceterum lineis conspicuo-tuberculatis.

CHINA: Szechuan: Mt. Omei, *C. Y. Chiao & C. S. Fan 263*; same locality, *C. L. Chow 5777*; *W. P. Fang 16320* (TYPE, staminate flower), *17522* (TYPE, fruit); *W. K. Hu 8803* (sterile); *T. T. Yü 296*.

The leaves of this species appear to resemble those of *T. craveniana* S. Y. Hu in size and texture, but the basal lobes of the latter species point backward and its fruit has a bony rugose endocarp, while the basal lobes of this species all point outward and the endocarp is pergameneous and conspicuously tuberculate. The fruit characters suggest relationship with *T. szechuanensis* S. Y. Hu. Occasionally a few leaves of certain specimens, such as *Chiao & Fan 263*, are short and broad, appearing sagittate-ovate. This character suggests some relationship with *T. capillipes* Gagnepain, which has pubescent sepals. On account of its resemblance to several species in different respects, it is here treated as an intermediate species.

Tinospora szechuanensis sp. nov. (*Pl. I, fig. 1*).

Frutex scandens, ramis striatis et sulcatis, 2.5–3 mm. diametro, hornotinis hirsutis, internodiis 6–7 cm. longis; foliis subcoriaceis, integris, sagittatis, 10–13 cm. longis, 4–4.5 cm. latis, basi sagittatis, interstitiis inter apices auricularum 5.5 cm. longis, apice acuminatis, acumine 15–20 mm. longo, cuspidato, supra glabris, subtus praeter nervos glabris, nervis primariis 5, palmatis, utrinque elevatis, nervis secundariis laxe reticulatis, supra obscuris, subtus prominulis; petiolo 5.5–6 cm. longo, glabrescente; floribus ignotis; infructescentiis paniculatis, pedunculis 9 cm. longis, axibus secundariis 10–15 mm. longis, pedicellis 5–10 mm. longis, cum pedunculis hirsutis; fructibus ellipsoideis, 11 mm. longis, 7–8 mm. diametro, stigmatis subapiculatis, endocarpiis pergameneis, subellipsoideis, 8 mm. longis, 7 mm. latis, ventro excavatis, dorso lineis conspicuo-tuberculatis.

CHINA: Szechuan: Hung-ya, Wa-wu shan, *E. H. Wilson 3528* (TYPE, fruit).

This species is characterized by its subcoriaceous sagittate leaves with the auricles pointing outward, paniculate infructescence with peduncles 9 cm. long, and ellipsoid drupes with conspicuously tuberculate parchment-like endocarp. It is closely related to *T. sagittata* (Oliver) Gagnepain, but the leaves of the latter species are linear-lanceolate, sagittate, with the auricles pointing backward, the infructescences are racemose with the peduncles 4–6 cm. long; and the fruits are subspherical with bony endocarp inconspicuously tuberculate (*Pl. I, fig. 3*).

Tinospora yunnanensis, sp. nov. (*Pl. I, fig. 4*).

Frutex scandens, ramulis striatis et sulcatis, vetustioribus tuberculatis, lenticellis conspicuis, orbiculatis, elevatis, hornotinis hirsutis vel glabrescentibus; foliis subcoriaceis, sagittato-ovatis, 12–14 cm. longis, 4.5–5.5 cm. latis, basi cordato-sagittatis, auriculis rotundatis, interstitia inter apices auricularum 1.5–2.5 cm. longa, apice acuminatis, acumine 11–13 mm. longo, apiculato, utrinque rugosis, praeter nervos subtus glabris, nervis primariis 7, utrinque evidentibus, reticulatis obscuris; inflorescentiis staminatis, ramis vetustis positis, racemosis, racemis solitariis vel fasciculatis, pedunculis 4–5.5 cm. longis, glabrescentibus, bracteis lanceolatis, 2 mm. longis, apice ciliatis, pedicellis 7–10 mm. longis, pilosis; sepalis 6, extimis ellipticis, 1.5 mm. longis, 0.75 mm. latis, intimis unguicularibus, 2 mm. longis, 1.5 mm. latis, glabris; petalis 6, suborbicularibus, basi cuneatis; staminibus 6, filamentis petalis subaequalibus; ovario rudimentario globoso; floribus pistillatis fructibusque ignotis.

CHINA: Yunnan: without precise locality, *H. T. Tsai 53100* (TYPE).

This species is closely related to *T. capillipes* Gagnepain, but the latter species has villose sepals, while those of this species are glabrous.

Chimonanthus salicifolius, sp. nov.

Frutex, ramulis subteretis, puberulis; foliis lineari-lanceolatis, 3–9 cm. longis, 1–3 cm. latis, basi obtusis, apice obtusis vel acutis, subcoriaceis, supra glabra, paulum nitidis, subtus opacis, hirsutis, costa utrinque elevata, nervis lateralibus 5 vel 6 paribus, reticulatis; floribus solitariis, axillaribus, pedicellis brevissimis, 4 mm. longis, bracteolis imbricatis, ovatis, puberulis; perianthiis exterioribus rotundatis, puberulis, interioribus ignotis.

CHINA: Kiangsi: Hsiu-shui, *Y. K. Hsiung 5489* (TYPE).

This species is closely allied to *C. nitens* Oliver, but the latter species has glabrous ovate-elliptic leaves with a long acuminate apex.

Euonymus orgyalis W. W. Smith in Notes Bot. Gard. Edinb. 13: 161. 1921.

CHINA: Yunnan: Si-chour hsien, Faa-doou, *K. M. Feng 12044*; same district, Ma-chia, *K. M. Feng 12502*; Mar-li-po, Huang-jin-in, *K. M. Feng*

13067; Mengtze, *A. Henry 11404*; Ping-pien hsien, *H. T. Tsai 55328*, *55345*, *60197*, *60967*, *61020*, *61395*, *61744*, *61778*, and *62446*.

The description of this species was based on a flowering specimen collected by *A. Henry* (*10661*) in southeastern Yunnan at an altitude of 2100 meters. The largest leaf of that material measures only 9 cm. long and is rounded at the base. Additional material from the same general area exhibits variations in the size and shape of the leaves and in the habit of the plant. As we now know it, the larger leaves of this species measure up to 15 cm. long and 7 cm. wide and are oblong-elliptic in shape. *Tsai 55328*, also a flowering specimen, even possesses an evergreen habit. In southeastern Yunnan the plant occurs at altitudes as low as 1300 meters, in ravines, on rocky crevices, or along the streams of the mixed forest zone. It is usually a shrub 2–3 m. high but occasionally appears scandent. The green flowers appear in late May. The specimen collected in early September has very small young fruit, the one collected in mid-October has fruit reaching mature size, and that collected in November has fruit dehiscent by apical slits. The mature fruit is globose, 12 mm. in diameter, with a rough and woody pericarp.

Craibiodendron kwangtungense, sp. nov.

Craibiodendron stellatum sensu Merrill in Lingn. Sci. Jour. 7: 319. 1931, non (Pierre) W. W. Smith 1914.

Arbor sempervirens, 10–12 m. alta, ramulis glabris, lenticellis obscuris; foliis alternis, coriaceis, olivaceo-brunneis, supra nitidis subtus opacis, ellipticis vel lanceolatis, 6–8 cm. longis, 1.8–3 cm. latis, integris, utrinque attenuatis, basi acutis vel cuneatis, apice acutis, obtusis, raro breviter acuminatis, costa supra impressa, subtus elevata, nervis lateralibus 18–22 paribus, supra evidentibus, subtus prominentibus, margine anastomosantibus, reticulatis distinctis, stipulis obsoletis, petiolo 8–10 mm. longo; inflorescentiis racemosis simplicibus, axillaribus, rhachibus 4–5 cm. longis, minute puberulis, bracteis lanceolatis, 2 mm. longis, ciliatis, deciduis; pedicellis 2–3 mm. longis, furfuraceis puberulisque, prophyllis 2, submedio instructis; calycibus cyathiformibus, 2–3 mm. diametro, sparse puberulis, lobis 5, rotundatis, ciliatis; corolla breviter campanulata, glabra; staminibus 10, inclusis, filamentis glabris, antheris basi subsaccatis, dorso muticis; ovario globoso, 1 mm. longo, 5-loculari, stylo columnari, 2 mm. longo; capsulis depresso-globosis, 14 mm. longis, 18 mm. diametro, profunde 5-angulatis, pericarpiis ligneis; seminibus in loculo quoque 12–14, subovoideis, leviter compressis, 2 mm. longis, 2 mm. latis, alis obliquis, 10 mm. longis, 8 mm. latis, rugosulo-striatis.

CHINA: Kwangtung: Ting-wu-shan, *Y. Tsiang 792* (TYPE, flower), *1533*, *1547*; Kwangsi: south of Nan-ning, Seh-feng-dar shan, *R. C. Ching 8293* (TYPE, fruit).

Craibiodendron kwangtungense is a tree 14 meters high with a trunk 30 cm. in diameter. It occurs in southwestern Kwangtung and southeastern Kwangsi at an altitude of six hundred meters. By the lanceolate leaves,

attenuated at both ends, and the glabrous corolla, it can be distinguished from *C. stellatum* (Pierre) W. W. Smith, which has oblong leaves rounded at the apex, and pubescent corolla. It is also related to *C. henryi* W. W. Smith, which has long acuminate leaves, paniculate racemes, smaller fruits which are only 8 mm. long and 10 mm. in diameter.

Craibiodendron kwangtungense var. **frutescens,** var. nov.

Frutex 2–3 m. altus, ramulis puberulis; foliis oblongo-ellipticis, 5–6 cm. longis, 2.5–3.5 cm. latis, apice obtusis vel abrupte brevi-acuminatis, racemis puberulis simplicibus, axillaribus.

CHINA: Kwangtung: Ting-wu-shan, *W. Y. Chun 6363.* Kwangsi: Shang-sze, Shap-man-taai shan, *W. T. Tsang 22252* (TYPE).

This variety differs from the typical *C. kwangtungense* in habit, being a shrub 2–3 meters high; also it has broader leaves and more pubescent racemes.

Ligustrum subsessile, sp. nov.

Frutex, ramulis robustis, teretis, cineraceis, triannis 5 mm. diametro, longitudinaliter minute rimulosis, lenticellis orbicularibus, cicatricibus foliorum semicircularibus, elevatis, hornotinis 2–3 mm. diametro, internodiis 2–3 cm. longis, ± striatis, in triis sparse pilosis, ceterum glabris, lenticellis conspicuis; foliis subsessilibus, integerrimis, subcoriaceis, ovato-oblongis vel oblongis vel raro suborbicularibus, utrinque rotundatis, 4–9 cm. longis, 3–4.5 cm. latis, glabris, subtus punctatis, costa supra plana, subtus leviter elevata, nervis lateralibus 4 usque 9 paribus, supra obscuris, subtus evidentibus, petiolo 1–2 mm. longo, glabro; floribus ignotis; infructescentiis paniculatis, paniculis compactis, subcylindraceis, 4–6 cm. longis, 2–4 cm. diametro, pedunculis 1.5–2 cm. longis, sparse puberulis, rhachibus subquadrangularibus, in striis sparse puberulis, axibus secundariis 5–15 mm. longis, sparse minute puberulis, pedicellis 1–2 mm. longis, glabris; sepalis persistentibus 3 mm. diametro, lobis 4, rotundatis, glabris; fructibus oblongo-subglobosis, 5–7 mm. longis, 4–6 mm. diametro.

CHINA: Kiangsi: [Hsiu-shiu], Hwang-lung shan, Nung-lung temple, *Y. K. Hsiung 5629* (TYPE).

This species has been reported to be a common shrub in thickets along the streams of the Kiangsi-Hupeh-Hunan border. The specimen cited above was collected in late August. The fruits are still too young for the study of the seed characters. I have not been able to match it with any *Ligustrum* in our collection. The general appearance of the compact inflorescences and of some of the smaller leaves resembles that of those shown in Hooker's illustration (Bot. Mag. 123: *pl. 7519.* 1897) for *Ligustrum coriaceum* Carrière, a species published on the basis of cultivated plants introduced to European gardens by Robert Fortune, reportedly from Japan. But specimens from European and Japanese gardens (such as those from Hort. Vilmorin of France, the Royal Botanic Gardens at Kew in Eng-

land, and the Botanical Garden of Tokyo) which match Carrière's and Hooker's descriptions and illustrations, all have smaller leaves, the smallest ones being 1.5 cm. long, 1 cm. wide, and the largest ones being 4 cm. long, 3 cm. wide. They all have comparatively longer petioles which are 3–7 mm. long. In comparing them with Hsiung's collection from Kiangsi, I conclude that the latter, with its subsessile large leaves, is specifically distinct.

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EXPLANATION OF THE PLATES

PLATE I

FIG. 1. A habit sketch of a fruiting branch of *Tinospora szechuanensis* showing the basal lobes of the leaf pointing outward. FIG. 2. A habit sketch of a fruiting branch of *Tinospora imbricata* showing the imbricate basal lobes of the leaf. FIG. 3. A habit sketch of a staminate flowering branch of *Tinospora henryi* with a separate flower enlarged 5 times. FIG. 4. A habit sketch of a leafy branch of *Tinospora yunnanensis* and a staminate flowering branch showing the inflorescences on old growth, with a separate staminate flower and a smaller outer and a larger inner sepal enlarged 5 times. FIG. 5. A habit sketch of a fruiting branch of *Tinospora intermedia* with a separate staminate flower enlarged 5 times. FIG. 6. A habit sketch of a fruiting branch of *Tinospora craveniana* with a separate staminate flower enlarged 5 times.

PLATE II

FIG. 1. A habit sketch of *Craibiodendron kwangtungense* showing solitary axillary racemes. FIG. 2. A flower after anthesis (× 10). FIG. 3. Two anthers, dorsal and sublateral view (× 18). FIG. 4. A fruit (× 1½). FIG. 5. A seed (× 5).